IN THE CLAIMS:

Please AMEND the claims as indicated below:

1-30. (CANCELED).

31. (CURRENTLY AMENDED) A method comprising:

forming on a substrate a multilayer film stack of alternating layers of high refractive index material and low refractive index material; and

cutting away a portion of the multilayer film stack so that at least one layer successively arranged from an outermost surface of the multilayer film stack has a predetermined portion in which material of the respective layer does not exist so that the respective layer is thereby non-uniform across the multilayer film stack, wherein

the multilayer film stack, having said portion cut away, reflects radiation in a range from vacuum ultraviolet through X-ray,

more than one alternating layer of high refractive index material and low refractive index material of the multilayer film stack, having said portion cut away, adjusts a wavefront phase of emerging rays, and

said cutting away cuts away said portion <u>to thereby change the wavefront phase where said portion is cut away</u> in accordance with an amount of adjustment of the wavefront phase.

32. (PREVIOUSLY PRESENTED) The method according to claim 31, wherein the multilayer film stack is formed in a number of cycles larger than that necessary to saturate a reflectance.

33. (PREVIOUSLY PRESENTED) The method according to claim 31, wherein said cutting away is controlled by detecting a difference in a material that forms the multilayer film stack.

34. (PREVIOUSLY PRESENTED) The method according to claim 33, wherein a difference in material is detected by monitoring a secondary electron discharge.

35. (PREVIOUSLY PRESENTED) The method according to claim 33, wherein a difference in material is detected by monitoring an optical change of characteristics.

36. (PREVIOUSLY PRESENTED) The method according to claim 35, wherein said

optical change of characteristics monitored is a change in an optical constant of visible rays or a change based on ellipsometry.

37. (PREVIOUSLY PRESENTED) A method for forming an optical element that reflects radiation in a range from vacuum ultraviolet through X-ray, comprising:

forming on a substrate a multilayer film having a stack of alternating layers of high refractive index material and low refractive index material in a number of cycles larger than necessary to saturate reflectance;

forming a correction film on the multilayer film; and

cutting away a portion of the correction film and the multilayer film stack in accordance with an amount of adjustment of a wavefront phase of emerging rays.

38. (CURRENTLY AMENDED) A multilayer film reflection mirror that reflects radiation in a range from vacuum ultraviolet through X-ray comprising:

a multilayer film formed by a plurality of repeated pairs of layers, layers of each pair of layers having different refractive indexes from each other, at least one layer successively arranged from an outermost surface of the multilayer film having a predetermined portion in which material of the respective layer does not exist so that the respective layer is thereby non-uniform across the multilayer film, and more than one pair of layers among said plurality of repeated pairs of layers adjusting a wavefront phase of a light reflected by said multilayer film, wherein the wavefront phase where said portion does not exist is different than the wavefront phase would have been if said portion had existed.

39. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 38, wherein said wavefront phase is adjusted with more than one layer among said plurality of repeated pairs being partially removed.

40. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 39, wherein removal of the multilayer film is stopped at a portion of a layer having a relatively higher refractive index among said layers with different refractive indexes from each other.

41. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 40, wherein said layer having a relatively higher refractive index is made of silicon.

42. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 38, wherein the multilayer film is formed by repeated pairs of layers whose number exceeds a number at which reflectivity is substantially saturated.

43. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 42, wherein said wavefront phase is adjusted with more than one layer among the pairs of layers where the reflectivity is already saturated being partially removed.

44. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 42, wherein reflectivity of said multilayer film is between about 15% and about 80%.

45. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 38, wherein said light is an EUV light.

46. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 38, wherein said multilayer film is formed by pairs of molybdenum and silicon layers.

47. (PREVIOUSLY PRESENTED) The multilayer film reflection mirror according to claim 38, wherein said multilayer film is one of a multilayer film formed by pairs of ruthenium and silicon layers, a multilayer film formed by pairs of rhodium and silicon layers, a multilayer film formed by pairs of ruthenium and carbon layers, or a multilayer film formed by pairs of rhodium and carbon layers.

48. (CURRENTLY AMENDED) An exposure apparatus comprising:

a multilayer film reflection mirror reflecting radiation in a range from vacuum ultraviolet through X-ray and having a multilayer film formed by a plurality of repeated pairs of layers, layers of each pair of layers having different refractive indexes from each other, at least one layer successively arranged from an outermost surface of the multilayer film having a predetermined portion in which material of the respective layer does not exist so that the respective layer is thereby non-uniform across the multilayer film, and more than one pair of layers among said plurality of repeated pairs of layers adjusting a wavefront phase of a light reflected by said multilayer film, wherein the wavefront phase where said portion does not exist is different than the wavefront phase would be if said portion existed.

49. (CURRENTLY AMENDED) A method of manufacturing a multilayer film reflection

mirror that reflects radiation in a range from vacuum ultraviolet through X-ray, comprising:

forming a multilayer film having a plurality of repeated pairs of layers, each pair of layers having layers with different refractive indexes from each other, at least one layer successively arranged from an outermost surface of the multilayer film having a predetermined portion in which material of the respective layer does not exist so that the respective layer is thereby non-uniform across the multilayer film, and more than one pair of layers among said plurality of repeated pairs adjusting a wavefront phase of a light reflected by said multilayer film, wherein the wavefront phase where said portion does not exist is different than the wavefront phase would be if said portion existed.

50. (PREVIOUSLY PRESENTED) The method according to claim 49, further comprising partially removing at least one layer among said plurality of repeated pairs of layers in which said wavefront phase is adjusted, to thereby provide said at least one layer successively arranged from an outermost surface of the multilayer film having a predetermined portion in which material of the respective layer does not exist.

51. (PREVIOUSLY PRESENTED) The method according to claim 50, wherein the removing of the multilayer film is stopped at a portion of a layer having a relatively higher refractive index among said layers in a pair having different refractive indexes from each other.

52. (PREVIOUSLY PRESENTED) The method according to claim 51, wherein said layer having a relatively higher refractive index is made of silicon.

53. (PREVIOUSLY PRESENTED) The method according to claim 49, wherein said multilayer film is formed by repeated pairs whose number exceeds a number at which reflectivity substantially is saturated.

54. (PREVIOUSLY PRESENTED) The method according to claim 53, further comprising partially removing more than one layer among the pairs of layers of the multilayer film where the reflectivity is already saturated, to thereby provide said at least one layer successively arranged from an outermost surface of the multilayer film having a predetermined portion in which material of the respective layer does not exist.

55. (PREVIOUSLY PRESENTED) The method according to claim 53, wherein reflectivity of said multilayer film is between about 15% and about 80%.

56. (PREVIOUSLY PRESENTED) The method according to claim 49, wherein said light is an EUV light.

57. (PREVIOUSLY PRESENTED) The method according to claim 49, wherein said multilayer film is made from molybdenum and silicon layers.

58. (PREVIOUSLY PRESENTED) The method according to claim 49, wherein said multilayer film is one of a multilayer film formed with pairs of ruthenium and silicon layers, a multilayer film formed with pairs of rhodium and silicon layers, a multilayer film formed with pairs of ruthenium and carbon layers, or a multilayer film formed with pairs of rhodium and carbon layers.

59. (CURRENTLY AMENDED) An optical element comprising:

a substrate having a multilayer film formed thereon, the multilayer film having a stack of alternating layers of high refractive index material and low refractive index material in a number of cycles larger than necessary to saturate reflectance; and

a correction film on the multilayer film,

wherein the optical element reflects radiation in a range from vacuum ultraviolet through X-ray, and the correction film and the stack each have a cut away portion to thereby change a wavefront phase of emerging rays where said portion is cut away corresponding to an amount of adjustment of the[[a]] wavefront phase~~ of emerging rays~~.